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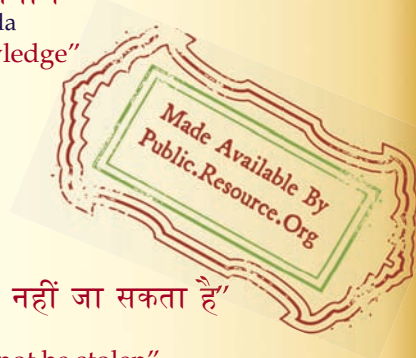
IS 10018 (1981): Lacquer, cellulose, nitrate, clear, finishing, glossy for wood [CHD 20: Paints, Varnishes and Related Products]



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“Knowledge is such a treasure which cannot be stolen”

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Indian Standard
SPECIFICATION FOR
LACQUER, CELLULOSE NITRATE, CLEAR,
FINISHING, GLOSSY FOR WOOD

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR LACQUER, CELLULOSE NITRATE, CLEAR, FINISHING, GLOSSY FOR WOOD

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Indian Standard
**SPECIFICATION FOR
LACQUER, CELLULOSE NITRATE, CLEAR,
FINISHING, GLOSSY FOR WOOD**

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 20 November 1981, after the draft finalized by the Paints and Allied Products Sectional Committee had been approved by the Chemical Division Council.

0.2 The material intended for decoration and protection of wood and metal surfaces so far, was covered in IS : 349-1955*. On review this specification was split into two separate standards, one covering the material used for protection and decoration of wood, and other for material used for protection and decoration of metal surfaces including electroplated surfaces. Accordingly IS : 349-1981† has already been issued separately which covers the material used for metal surfaces only.

0.3 This standard covers clauses **4.1** and **4.2.1** which call for agreement between the purchaser and the supplier.

0.4 In the preparation of this standard substantial assistance has been derived from data supplied by M/s Addisons Paints & Chemicals Ltd, Madras which is thankfully acknowledged.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960‡. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes requirements and methods of sampling and test for lacquer, cellulose nitrate, clear, finishing, glossy for wood.

*Specification for lacquers, cellulose, clear.

†Specification for lacquer, cellulose nitrate, clear, finishing, glossy for metal (*first revision*).

‡Rules for rounding off numerical values (*revised*).

1.1.1 The material is used for protection and decoration of wooden articles like table tops, high grade furniture, bank counters, radio and TV cabinets, etc.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given under **2** of IS : 197-1969* shall apply.

3. REQUIREMENTS

3.1 Description — The material shall be clear, transparent and free from foreign matter, sediment and undissolved water.

3.2 Composition — The material shall be based on cellulose nitrate, plasticizers and resins, dissolved in suitable solvents with diluents in suitable proportions to satisfy the requirements of this standard.

3.3 Compatibility and Thinning — The material shall be compatible with lacquer thinner conforming to IS : 5667-1970† and may be thinned up to a thinning ratio of one part of the lacquer and 1.5 parts of the thinner for convenience of application. The thinned lacquer shall be clear, free from insoluble material and suitable for application by spraying. The exact thinning ratio and application viscosity may vary with individual manufacturers product. The thinning viscosity of 18 to 25 seconds at 30°C when tested as prescribed in **7.4** of IS : 101-1964‡ is suitable for spray application of the lacquer.

3.4 Freedom from Benzene and Chlorinated Hydrocarbon Solvents — The material when tested as prescribed in Appendix A shall pass the test.

3.5 Resistance to Water — The material shall conform to the test as prescribed in Appendix B.

3.6 The material shall also comply with the requirements given in Table 1.

*Methods of sampling and test for varnishes and lacquers (*first revision*).

†Specification for thinner for cellulose nitrate based paints and lacquers.

‡Methods of test for ready mixed paints and enamels (*second revision*).

TABLE 1 REQUIREMENTS FOR LACQUER, CELLULOSE NITRATE, CLEAR FINISHING, GLOSSY FOR WOOD(*Clauses 3.6 and 6.1*)

SL No.	CHARACTERISTIC	REQUIREMENT	METHODS OF TEST, REF TO	
			Appendix	Cl No. in IS : 197-1969*
(1)	(2)	(3)	(4)	(5)
i)	Drying time and compatibility			
a)	Surface Dry	First, second and third coats - 20 minutes with no tendency to lift the under-lying coats.	—	7
b)	Ready for rubbing and polishing	16 hours	—	7.2
ii)	Colour in 1-in.cell on luvibond scale expressed as $\bar{Y} + 5R$, not deeper than	16	—	9†
iii)	Consistency	Smooth and uniform and suitable for spraying, after thinning as prescribed in 3.3	—	—
iv)	Finish	Smooth and glossy	—	8
v)	Scratch hardness under a load of 500 g	To pass the test	—	10
vi)	Flexibility and adhesion after 48 hours air-drying	To pass the test	—	11 (Method 1)
vii)	Flash point, <i>Min</i> , °C	14	—	13
viii)	Volatile matter, percent by mass, <i>Max</i>	70	C	—
ix)	Freedom from blushing and blooming	To pass the test	D	—
x)	Suitability for rubbing down	To pass the test	E	—
xi)	Self lifting	To pass the test	F	—
xii)	Keeping properties	Not less than one year from the date of manufacture	—	20

*Methods of sampling and test for varnishes and lacquers (*first revision*).†May be done on the lines of test method prescribed in 13 of IS : 548 (Part I)-1964
Method of sampling and tests for oils and fats: Part I Sampling, physical and chemical tests (*revised*).

4. PACKING AND MARKING

4.1 Packing — The material shall be packed in metal containers as agreed between the purchaser and the supplier.

4.2 Marking — Each container shall be marked with the following particulars:

- a) Name and colour of the material;
- b) Name of the manufacturer and his recognized trade-mark, if any;
- c) Volume of the material;
- d) Thinning ratio;
- e) Batch No. or lot No. in code or otherwise; and
- f) Month and year of manufacture.

4.2.1 Other details of marking shall be as agreed between the purchaser and the supplier.

4.2.2 The containers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

4.2.3 The material when intended for defence purposes, shall be packed and marked in accordance with IS : 5661-1970*.

5. SAMPLING

5.1 Preparation of Test Samples

5.1.1 Tender Sample — The supplier may dispense with sending a tender sample provided he declares that the material for which the tender is given is of same quality as the sample previously registered in his name.

5.1.2 Bulk Supply Sample — Representative sample of the material shall be drawn as prescribed under 3 of IS : 197-1969†.

*Code of practice for packing and marking of packages of paints, enamels, varnishes and allied products.

†Methods of sampling and test for varnishes and lacquers (*first revision*).

6. TEST METHODS

6.1 The tests shall be carried out as prescribed in IS : 101-1964*, IS : 197-1969† and Appendices A to F. References to relevant clauses of IS : 197-1969† is given in col 5 of Table 1 and that of Appendices in **3.4**, **3.5** and col 4 of Table 1. Reference to relevant clauses of IS : 101-1964* is given in **3.3**.

6.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977‡) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

APPENDIX A

(*Clause 3.4*)

TEST FOR FREEDOM FROM BENZENE AND CHLORINATED HYDROCARBON SOLVENTS

A-0. GENERAL

A-0.1 Outline of the Method — The material is steam distilled and solvents collected. It is subjected to test for benzene and chlorinated hydrocarbons qualitatively.

A-1. APPARATUS

A-1.1 Steam Distillation Apparatus

A-1.2 Distilling Flask — 100 ml capacity.

A-1.3 Bunsen Burner

A-2. REAGENTS

A-2.1 Nitric Acid — *see* IS : 264-1976§.

A-2.2 Sulphuric Acid — *see* IS : 266-1977||.

A-2.3 Copper Wire — 0.914 to 1.219 mm in diameter.

*Methods of test for ready mixed paints and enamels (*second revision*).

†Methods of sampling and test for varnishes and lacquers (*first revision*).

‡Specification for water for general laboratory use (*second revision*).

§Specification for nitric acid (*second revision*).

||Specification for sulphuric acid (*second revision*).

A-3. PROCEDURE

A-3.1 Steam distil 100 ml of the material using a receiver cooled in ice. Separate the solvent layer, wash with several times its volume of distilled water, discard the washings, dry and redistil, collecting all solvents within the agreed specified boiling range, subject this to the tests prescribed in **A-3.1.1** and **A-3.1.2**.

A-3.1.1 *Test for Benzene* — Mix equal volumes of nitric acid and sulphuric acid in a test-tube and cool. To 2 ml of this solution add 10 drops of the solvent and shake. Warm, if necessary and examine for the odour of nitrobenzene which is given by 5 percent benzene or larger amounts of toluene. Boil the contents for at least 30 seconds, allow to cool and add 10 ml of water. Mix the contents and examine for odour of nitrobenzene, which should be no longer present if the contents were boiled enough. Allow the tube to stand for some time. A yellow cloudy solution or flocculent precipitate changing to yellow needles is evidence of the presence of benzene. It may further be confirmed by separating the yellow needles and finding out its melting point which should be 89° to 90°C. In case of dispute, gas chromatography may be employed to detect the presence of benzene using analytical grade benzene as standard.

A-3.1.2 *Test for Chlorinated Hydrocarbons* — Form a small loop in the copper wire and heat in a small Bunsen flame until it no longer colours the flame. Allow the loop to cool and then dip it into the test solution. Immediately place in the outer part of the flame and when the first luminous flame disappears, examine for the green colouration due to chlorinated compounds.

A-3.2 The material shall be deemed to have passed the test if the solution when tested as prescribed in **A-3.1.1** does not give off smell of nitrobenzene or forms yellow crystals and when tested as prescribed in **A-3.1.2** does not impart a green colouration to the Bunsen flames.

APPENDIX B

(Clause 3.5)

DETERMINATION OF RESISTANCE TO WATER

B-0. GENERAL

B-0.1 Outline of the Method — The varnish coated panel, after specified drying period, is immersed in distilled water for 48 hours at room temperature and examined for any signs of deterioration and change in gloss.

B-1. PROCEDURE

B-1.1 Apply a coat of material to a glass panel prepared as prescribed under 5.3 of IS : 197-1969* to give a dry film weight commensurate with the weight per 10 litres of the material as specified in 6.4 of IS : 197-1969*. Allow the panel to air dry in a horizontal position for 48 hours. Immerse the panel in distilled water (conforming to IS : 1070-1977†) at room temperature for 48 hours. Remove it from water and examine after 4 hours.

B-1.2 The film shall show no signs of deterioration and shall retain at least 60 percent of the original gloss as determined in the glossmeter described under 7.7 of IS : 101-1964‡. Loss of adhesion alone shall not be considered a cause of rejection.

APPENDIX C

[Table 1, Item (viii)]

DETERMINATION OF VOLATILE MATTER**C-1. PROCEDURE**

C-1.1 Weigh accurately about 3.0 to 3.5 g of the well mixed material in a flat-bottomed, circular dish about 77 mm diameter. Heat the dish and the contents on a water bath maintained at 60° to 70°C for a period of 2 hours. At the end of this period, wipe the dish dry from the outside, keep in a desiccator for 2 hours and weigh.

C-2. Calculate and express the volatile matter (loss in weight) as percentage of the mass of the material taken for the test.

APPENDIX D

[Table 1, Item (ix)]

TEST FOR BLUSHING AND BLOOMING**D-1. PROCEDURE**

D-1.1 Spray the material at the room temperature and at a relative humidity not exceeding 70 percent on to a 150 × 150 mm glass plate and allow it to air-dry for one hour at the room temperature in a well ventilated chamber free from draught and dust and examine the panel.

D-2. The film shall show no tendency to blush or bloom.

*Methods of sampling and test for varnishes and lacquers (first revision).

†Specification for water for general laboratory use (second revision).

‡Methods of test for ready mixed paints and enamels (second revision).

APPENDIX E

[Table 1, Item (x)]

TEST FOR SUITABILITY FOR RUBBING DOWN

E-1. TEST PANELS

E-1.1 The panels shall be seasoned teak wood conforming to the requirements of 5.4.1 of IS : 197-1969*. Panels shall be $600 \times 300 \times 25$ mm in size. The panels shall be bevelled at the edges and shall be smoothened by rubbing down with fine paper, the back being protected with a suitable paint.

E-2. PREPARATION OF TEST PANELS

E-2.1 In the painting procedure outlined under E-2.2 the air drying shall be done at the room temperature as defined under 2.3 of IS : 197-1969* and at a relative humidity of not more than 70 percent.

E-2.2 The surface of the test panels to be exposed shall be prepared as follows:

- a) Apply by a pad, a very thin coat of varnish, finishing, exterior, synthetic conforming to IS : 524-1968†. Allow to dry for 6 hours.
- b) Apply one coat of liquid transparent wood filler (conforming to IS : 345-1952‡) and remove the excess after it has dried to touch, by rubbing across the grains with jute fibres or hessian cloth and allow to dry for 24 hours.
- c) For coarse grained wood, a second application of the wood filler is recommended after the first application, has become dry to touch. Then allow to dry for 24 hours.
- d) Rub down with emery paper No. 240 and wipe off dust.
- e) Apply two coats of sanding sealer after thinning one part of the sanding sealer with one part of lacquer thinner (conforming to IS : 5667-1970§) with an interval of 15 minutes in between coats. Allow to dry for 16 hours.
- f) Sand with 320 wet or dry sand paper using kerosene as lubricants. Allow it to dry for 2 hours.

*Methods of sampling and test for varnishes and lacquers (*first revision*).

†Specification for varnish, finishing, exterior, synthetic (*first revision*).

‡Specification for wood filler, transparent, liquid.

§Specification for thinner for cellulose nitrate based paints and lacquers.

g) Spray 3 coats of lacquer, cellulose nitrate, clear, finishing, glossy, for wood, conforming to this specification after thinning one part of it with one and half parts of lacquer thinner (conforming to IS : 5667-1970*) with an interval of 20 minutes in between coats. Allow it to dry for 16 hours.

h) Sand down with 400 wet or dry sand paper using kerosene as the lubricant, wipe dry; allow to dry for one hour.

j) After this, one of the following shall be done:

Spray one re-flow coat after thinning one part of the clear with $2\frac{1}{2}$ parts by volume of the lacquer thinner. Allow to dry for 16 hours.

or

After sanding with 400 abrasive paper, pull over the surfacer with bodying fluid.

or

After drying for 16 hours, instead of the re-flow coat, rub the surface with water rubbing compound to remove orange peel if any and to level the surface.

k) Mechanical buffer may also be used.

Then polish with suitable liquid polish and finally with a good quality wax polish.

E-3. PROCEDURE

E-3.1 Prepare a panel up to stage (g) as given in **E-2.2**. Air dry for 16 hours and subject the same to rubbing as prescribed under **E-2.2** (h, j and k).

E-3.2 The material shall be deemed to have passed the test if the film polishes to a bright surface.

APPENDIX F

[Table 1, Item (xi)]

TEST FOR SELF LIFTING

F-1. PROCEDURE

F-1.1 Panel prepared according to details given in **E-2.2** shall not lift or wrinkle when touched up with the same lacquer after a period of 4 hours, 24 hours, 7 days and 2 months.

*Specification for thinner for cellulose nitrate based paints and lacquers.

IS : 10018 - 1981

(Continued from page 2)

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